

day was referred to the Babies' Hospital for admission, where he was under observation for nineteen days.

The patient was the third of three children. The others were apparently normal in every respect. The child was born at full term after normal delivery and the birth weight was recorded as nine pounds. The infant had not been nursed at any time. He had been fed on mixtures of whole milk, water and milk-sugar with small amounts of wheat flour. The stools had been normal; there had been no vomiting, but the child did not thrive. Prior to the onset of the symptoms, which were the cause of his admission to the hospital, the weight had been recorded as nine pounds.

The symptoms noted by the parents had been "cold in the head" associated with fever as high as 103° F. for one week, and rapid respiration, which was first noted the day prior to admission to the hospital.

Physical Examination. On examination the infant was found to be moderately well nourished and well developed. He looked acutely ill but was not greatly prostrated. Some dyspnea was evident and the skin of the entire body was slightly cyanotic. The weight was 3700 grams.

The measurements were: Head, 14 inches circumference; chest, 13 inches circumference; abdomen, 11 inches circumference; length, $22\frac{1}{2}$ inches circumference. Distance from top of cranium to umbilicus, 12 inches; distance from the umbilicus to the sole of foot, $10\frac{1}{2}$ inches; the anterior fontanelle measured 2×2 inches.

The posterior fontanelle was closed. The pupils reacted to light. The ears were normal and the right ear was slightly larger than the left. The lips were of a darker hue than the rest of the body. The throat was normal. The superficial lymph glands were not enlarged. The chest was of normal contour; the respiratory movements were somewhat limited and there were well-marked supra- and infraclavicular retraction. The maximum cardiac impulse was just below the xiphoid cartilage. The right border of the heart, as determined by percussion, was one inch to the right of the midsternal line and the left border two inches to the left of the same line. There was a distinct cardiac murmur heard over the entire precordium and also over the right chest posteriorly. It was systolic in time and transmitted to the vessels of the neck.

The lungs were apparently normal except for the presence of a few scattered moist rales heard at the bases behind. The abdomen was soft and slightly distended. There was a large mass, apparently liver, which occupied the upper quarter of the abdominal cavity. To the right of the midline the lower edge of this mass was horizontal and could be felt about one inch below the costal margin. To the left of the midline the lower edge ran obliquely downward and to the left, disappearing in the flank, where it was felt about two

inches below the free border of the ribs. The reflexes were normal. A left-sided hydrocele of the cord was present.

Clinical Course. During the infant's period of observation in the hospital fever was constantly present, fluctuating between 100° and 102°. For the first ten days he maintained his admission weight of 3700 grams and from then on steadily lost. His weight on the day of discharge was 3500 grams. The stools were normal for the first ten days of hospital observation. During the balance of the period they became more frequent, generally four or five in twenty-four hours. On the seventeenth day both ear-drums were incised and pus obtained.

A routine throat culture was done. This showed no Klebs-Loeffer bacilli. Both the von Pirquet test and the intracutaneous tuberculin test were negative. The urine was straw-colored, clear, acid, contained considerable albumin, a few white blood cells and many hyaline and granular casts. There was no sugar or acetone present. In a second urine examination, a few days later, albumin was present in the same proportion as previously reported, but no casts. One blood examination was done four days after admission. The hemoglobin was 100 per cent. White blood cells numbered 33,300, and were differentiated as follows: Polymorphonuclears, 66 per cent; eosinophiles, 3 per cent; small lymphocytes, 20 per cent; large lymphocytes, 5 per cent; large mononuclears and transitionals, 6 per cent. The platelets were increased in number.

Two roentgenographic examinations were made of the trunk. Both of these showed a cardiac shadow which extended considerably beyond the normal, both to the right and to the left. The liver shadow approximated the findings outlined by palpation as noted above, which proved at autopsy to be a transposition of the right and left lobes.

The infant was removed from the hospital nineteen days after admission; two days later severe respiratory symptoms developed, and he died at home the following day, December 6, 1921.

The autopsy was performed at the Babies' Hospital by the hospital pathologist, Dr. Martha Wollstein. The findings were as follows:

Anatomic Diagnosis: 1. Congenital absence of the spleen.

2. Congenital malformation of the heart (open auricular and ventricular septa—transposition of veins).

3. Congenital malformation of the lungs (supernumerary lobes).

4. Atelectasis and bronchopneumonia.

5. Congenital malformation of the liver (transposition of right and left lobes).

The body was that of a well-developed and fairly well-nourished white male infant. No skin lesions were present.

Lungs. No pleurisy. Left lung had three lobes divided by two well-marked fissures. It was well aerated throughout. The right lung had four lobes, *i. e.*, in addition to the three normal lobes there was a triangular lobe separated from the lower lobe by a well-marked fissure and corresponding to the sublingual lobe in the dog. In addition the right lower lobe had a small fissure near its upper angle extending about 3 cm., so that there was an incomplete fifth lobe. The right lower lobe was blue in color, smaller than the left lower, partly atelectatic and partly, in its anterior portion, the seat of a bronchopneumonia.

Bronchial Lymph Nodes. Normal.

Heart. Normal in position, pointing to the left and larger than normal. At the base it measured 5 cm. in diameter. In length it measured 6 cm. The apex was very round, and there was a shoulder to the right ventricle, which made the base wider than normal. The auricular appendages were much rounded. Both auricles were distended with softly clotted blood, making the appendages seem longer than usual. The ventricles were of about the same size and thickness. The pulmonary artery and aorta were normal. The ductus arteriosus was closed. The foramen ovale was very widely open. The interventricular septum had a large opening, 1.5 cm. in diameter, in its upper third. The venæ cavæ emptied into the left auricle and the pulmonary veins into the right auricle. The valves were all normal.

Liver. The liver measured 14 cm. transversely. The larger lobe was on the left side and its anteroposterior diameter was 8 cm. The smaller right lobe measured 6.5 cm. anteroposteriorly. The suspensory ligament and the inferior fissure were to the right of the gall-bladder, which was in the left lobe. The other lobes of the liver were normal. On section the liver substance was congested, but otherwise normal.

Spleen. Completely absent. No supernumerary spleens found after prolonged search. The celiac axis had been removed, so that search for the splenic vessel could not be made.

Kidneys. Lobulated and on section congested, with markings blurred. Cortex was not thickened.

Suprarenals and Pancreas. Normal.

Stomach and Intestines. Normal throughout. The cecum was in its normal position on the right side. The appendix was normal. Cecum and mesocolon were very freely movable.

Smears from the heart's blood were taken at autopsy and stained with Wilson's stain. They showed no abnormal forms of cells. The polynuclear leukocytosis noted during life was evidently due to the bronchopneumonia present, and there was nothing in the blood morphology to indicate any abnormality of the lymphatic system.

Discussion. In the most recent publication regarding the spleen, Sir Berkeley Moynihan states the following: "The spleen is not always present in man, though its absence is excessively rare. Its occasional absence is noted in animals. In the vertebral kingdom its position is not constant. In the majority of animals it is outside but associated with the gastric segment; but there are instances of its development in connection with the lower end of the canal and others where it is scattered." In many of the text-books of pathology and pathologic anatomy, such as Aschoff, Ribbert, Ziegler and Delafield and Prudden, it is stated that cases of complete absence of the spleen have been known to occur. In the *American Text-book of Pathology* the following statement regarding this condition is made: "Complete absence of the spleen is rare. In these cases the organ is usually represented by several small scattered masses of splenic tissue (splenunculi) which, on account of their size and location, are in danger of being overlooked." Kaufman also noted that "Absence of the spleen occurs but seldom," and he adds the interesting comment that the disappearance might occur in fetal life from an embolus of the splenic artery. Adami and Nichols observe that complete absence of the spleen is the rarest of the congenital anomalies affecting the spleen and that it is frequently found associated with other grave defects of development. "About thirteen cases are on record, but only one, that of Birch-Hirschfeld, is beyond cavil. More often the place of the spleen is taken by scattered nodules of splenic tissue in various parts (splenunculi)."

They refer to Albrecht's case, in which there were nearly four hundred of these splenunculi scattered throughout the abdominal cavity. This condition was present in a twenty-six-year-old man who died of nephritis. The normal splenic organ was wanting in this individual, and these accessory spleens varied greatly in size, the smallest being only as large as the head of a pin. In the case of congenital absence of the spleen reported by Sternburg the patient was a woman, aged seventy-three years, who had had four normal pregnancies and had had "lung trouble" for a long period of years. She died shortly after admission to the hospital, and at autopsy it was discovered she had advanced pulmonary tuberculosis. There was no spleen found nor any accessory spleens. The retroperitoneal lymphatics were not enlarged. The branch of the celiac artery, which should have corresponded to the splenic artery, was broken up into a series of small twigs, which passed in part to the stomach and in part to the colon. Sternburg quotes an article by Toldt, which we have not been able to locate, in which 17 cases had been collected, and of these only 4 were unassociated with other abnormalities. In the other 13 there were abnormalities of different grades; 11 of the cases were in the newborn or in infants in the first weeks of

life and 6 were among adults. These adults varied in age from eighteen to forty-nine years of age and in only 3 of these was the absence of the spleen the only abnormality found. Birch-Hirschfeld's case was noted in an infant who died directly after birth. The infant was well nourished and well developed, but the liver was very large. The spleen and the splenic vein were absent but the portal vein was normal.

In 1871, when this report was presented by Birch-Hirschfeld, he stated that he could find no other cases in the literature except one,* which was not accessible.

Glinski reported a case of a woman, aged forty-five years, who died of pulmonary tuberculosis. There were no other abnormalities noted at autopsy, no lymphatic hypertrophy, nor hypertrophy of other organs. Riches reported a case of a woman, aged forty-five years, who died in an institute for the insane following an operation for a round-cell sarcoma. He noted that this neoplasm occupied the site of the omentum; there were secondary deposits in the mesentery and lymphatic glands in the immediate vicinity of the growth. The autopsy findings failed to reveal any congenital abnormalities and careful search failed to reveal the presence of the spleen. Rose's case from Georgetown, British Guinea, occurred in a negro, aged fifty-six years, who died following an operation for strangulated hernia. At autopsy no spleen was found nor was there any splenic artery. He mentions the fact that there were no splenunculi present.

Hodenpyl's case, which he termed "apparent absence of the spleen," occurred in a negro, aged thirty-two years, who died after an illness of a week's duration. A compensating hyperplasia of the mesenteric and retroperitoneal lymph glands was present as well as a lymphatic hyperplasia of the suprarenals, the intestines and a cellular proliferation of Glisson's capsule.

The case reported by Martin in 1826 was in an infant, aged eight and a half months, who died following a series of convulsions. There was no spleen found at autopsy. The stomach was on the right side; above, it touched the liver and the diaphragm. The greater curvature touched the right kidney and the lesser touched the vertebral column, the head of the pancreas and the abdominal aorta. The first part of the duodenum was on the left side but the rest of the intestine was normal. The liver occupied both hypochondriac regions and was divided into two parts of equal size. The heart was large and the pulmonary artery and aorta were transposed. The auricles were large and communicated with each other. Each auricle furnished a superior and inferior vena cava. There was a single ventricular cavity, and, as Martin states, the heart resembled the heart of a fish.

* Pohl, Lips, 1740, De Defectu Lienis.

Koch and Wachmuth's case occurred in a well-nourished and well-developed tinsmith, aged forty-nine years, who died of bronchopneumonia. At the autopsy the diagnosis was confirmed; all the organs were anatomically normal, but the spleen and splenic artery were absent. The case reported by Lebby in 1834 could hardly be classified as congenital absence of the spleen. This report concerned an adult negro (age not mentioned) who was executed and the body autopsied for the instruction of medical students. The negro was sixty-eight inches tall, badly nourished but well developed. He gave a past history of "bilious intermittent and remittent fevers." The author states that the spleen was absent, but relates further that "Contiguous to the pancreas was a sac the size of a large orange, oblong in form, of a dark ash color, shrivelled in appearance and imparting to the hand the sensation of squeezing a decayed orange; upon opening the sac it was found to contain pus of a creamy hue and consistency."

Ramsey's case also occurred in a negro slave, aged twenty-eight years, who had been ill for almost a year with intestinal symptoms accompanied by great loss of weight. At autopsy no spleen was found. As the author expressed it, "The spleen was wanting *in toto*, there was some suppurative matter about its situation, but nothing remained of it except a few ligamentous traces to mark the place of its existence." From this description one is obviously not justified in terming this case one of congenital absence of the spleen.

In an editorial notice in 1845, J. J. Sachs refers to a case reported before a Russian medical society the previous year by a Dr. Meinhard, of a woman, aged forty-seven years, who died in Peter-Paul's Hospital, in whom no trace of a spleen nor of splenic bloodvessels could be found at autopsy. There has evidently been some confusion in the literature regarding this case and the various references to it. Jelenski refers to this case and gives the age of the woman as fifty-seven years. Hodenpyl refers to the citation of Jelenski's and states that the latter mentions that Sachs performed an autopsy on an adult who had no trace of a spleen. As a matter of fact there was only one case, which was the one autopsied by Meinhard. Sachs merely referred to this case in an editorial note which was quoted by Jelenski thirty-five years later, and has since often mentioned as his own case.

Olaechea's case, with a carefully recorded autopsy, occurred in a young man who died of "tifomalaria." The age of the patient was not mentioned, but as he was a sergeant in a Peruvian regiment it may be assumed that he was a young man. At autopsy no trace of a spleen was found nor was there any evidence of suppurative splenitis. Fatty and connective tissue occupied the normal site of the spleen. There were no anomalies of the other organs, nor was there any scar of the abdominal walls through

which the spleen might have been previously removed. The liver was congested and there was a congestion of Peyer's patches, but no ulceration. The bronchial and mesenteric lymph nodes were greatly enlarged, some of the latter being $2\frac{1}{2}$ cm. in diameter. The inguinal and axillary lymph nodes were also greatly enlarged. The lymphatic hypertrophy was believed by the author to have been compensatory, due to the absence of the spleen.

Hodenpyl refers to a case cited as absence of the spleen reported by E. Moroni, but was unable to obtain access to the publication. We were able to secure this publication and discovered that it related to a dog whose spleen had been extirpated and who had been observed for a period of a year after splenectomy.

Kohlhaas has recently reported a case of a woman, aged fifty-four years, who died of cerebral hemorrhage due to arteriosclerosis. All the viscera were normally situated, but no spleen was demonstrable; careful search for accessory spleens or enlarged lymph glands was unsuccessful. There was no hyperplasia of the lymphoid tissue of the intestine. The liver was small and the splenic artery came well developed from the tripus Halleri. The bone-marrow was chiefly of a reddish color and a small portion was yellowish. Microscopic findings were normal. At the greater curvature of the stomach and at the diaphragm a collection of fat was found in the splenic region about 5 cm. long, 2 cm. wide and 1 cm. thick; on cross-section this was found to contain a small lymph gland 1 cm. long and 0.02 cm. thick; microscopically this showed no deviation from the normal lymph gland.

Robert's case occurred in a female infant who was extremely well developed except for a rudimentary forearm, wrist and hand. The infant died three days after birth. The autopsy showed an arrested development of the stomach and absence of the spleen and omentum. The stomach had failed to undergo a primary dilatation, but retained a configuration resembling that of the duodenum.

Arnold's case occurred in a female infant who died at the age of fifteen weeks. The autopsy showed anomalies of the heart and large cardiac bloodvessels; anomalies of the pulmonary veins; anomalies of the portal vein and the ductus venosus Arantii; anomalies of both venæ cavæ and of the hepatic veins. The spleen was missing. No changes were demonstrable.

Heusinger has collected 2 cases which are solely of historical interest. The first was reported by Lemery* of a female infant who died at the age of eight days. Externally she was apparently normal, but at autopsy it was discovered that the entire intestinal canal was absent as well as the spleen and the liver. Occupying the normal site of these organs was a "fleshy mass as large as a

* *Mémoires de l'Académie des Sciences*, 1704, p. 21.

child's head connected with the stomach but not with the anus, which contained arteries and veins." The second case dates back to the 16th century† and is reported as follows: "In September, 1564, a famous Antwerp merchant named Matthias Oetchius, a native of Germany, died and came to autopsy on the next following day. It was specially desired to ascertain the condition of the digestive organs, particularly the liver and spleen, for he had suffered some years previously from dropsy, a disease which is always connected with a primary or secondary pathologic condition of the liver. The expert surgeons searched under the diaphragm and the false ribs, but were unable to find any trace of these organs. This is a remarkable and unheard-of case, for the substance of the entire canal was fleshy, much firmer than muscle tissue, so as to equal nearly the firmness of heart muscle."

The case herein presented, as well as the other true cases of congenital absence of the spleen included in our collection, may be of some value in determining the importance of this organ. Although this congenital abnormality is often associated with other anatomic defects of development, it does occur as a single defect. In 9 of the cases from our collection the individuals with this anomaly reached middle life without recognizable disturbance, and one woman, who had had four normal pregnancies, died at the age of seventy-three. In our case and in the 4 other infants recorded there was apparently no hyperplasia of lymphoid tissue. In 7 of the adult cases, which were undoubtedly true cases of congenital absence of the spleen, there was no lymphoid hyperplasia, while in 2 there was definite lymphoid hyperplasia which was termed by the writers compensatory. If the lymphoid hyperplasia was in any way related to the absence of the spleen it is difficult to understand why the condition was not present in every case. In view of the fact that it was present in only 2 of the cases in our collection, it would seem that causes other than congenital absence of the spleen might have been responsible. From a review of the literature of this unusual anomaly one is justified in the conclusion that in certain individuals congenital absence of the spleen is apparently not a serious handicap.

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DELAY IN THE TREATMENT OF CANCER.¹

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SEVERAL years ago the statistics on delay in the treatment of cancer as seen in the first surgical or Cornell division of the New York Hospital were investigated. The results were quite startling, to say the least. Our cases were coming so late and frequently in such hopeless condition that a determined effort was made to ascertain the causes of delay.

Over 100 consecutive cases were questioned at length as to the time lost after the initial symptoms, first, before consulting a physician, and second, before entering a hospital for study and treatment. Incidentally we classified the physician's advice as good or poor, accordingly as he urged operation or counseled delay and palliation. We then classified our cases under curable, probably curable, incurable, operable and inoperable headings.

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